

Publication

Distinct sporulation dynamics of arbuscular mycorrhizal fungal communities from different agroecosystems in long-term microcosms

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 102956**Author(s)** Oehl, Fritz; Sieverding, Ewald; Ineichen, Kurt; Maeder, Paul; Wiemken, Andres; Boller, Thomas**Author(s) at UniBasel** [Boller, Thomas](#) ; [Ineichen, Kurt](#) ; [Wiemken, Andres M.](#) ;**Year** 2009**Title** Distinct sporulation dynamics of arbuscular mycorrhizal fungal communities from different agroecosystems in long-term microcosms**Journal** Agriculture, ecosystems and environment**Volume** 134**Number** 3-4**Pages / Article-Number** 257-268**Keywords** Arbuscular mycorrhiza, Community structure, Biodiversity, Life cycle, Life history strategies, Organic agriculture, Soil quality, Soil function

The aim of this study was to investigate sporulation dynamics of arbuscular mycorrhizal fungal (AMF) communities from agroecosystems differing in land use intensity in long-term experimental microcosms. These were set up with characteristic grassland plants (*Lolium perenne*, *Trifolium pratense*, *Plantago lanceolata*), and inoculated with soils from several grasslands and arable lands subjected to crop rotation or continuous monocropping. The microcosms were maintained under ambient light and temperature conditions over 3 years. A novel, localized sampling scheme was applied for attaining exclusively the newly formed spores at bimonthly intervals. Overall, 39 AMF species were detected by morphological spore identification. Some species were recovered from all sites, others exclusively from arable lands, or grasslands, or from all sites except under maize monocropping. Clear seasonal and successional AMF sporulation dynamics were revealed, implying different life strategies of different AMF species. A first group of *Glomus* spp., including *G. mosseae*, sporulated rapidly during the first season. A second group, including *G. constrictum* and *G. fasciculatum*, sporulated late in the first season and replaced the first group during subsequent seasons. A large third group, including *G. invermaium*, *G. macrocarpum* and *G. sinuosum*, sporulated much later, in the second or third season. *Acaulospora*, *Archaeospora* and *Ambispora* spp. sporulated mainly during spring and early summer, *Scutellospora* and *Cetraspora* spp. only in fall. While in the microcosms derived from arable lands, cumulative species numbers did not increase anymore after 2 years, the numbers still increased significantly in the microcosms from the grasslands indicating longer lasting periods of sporulation cycles. Remarkably, the arable land under organic farming produced the highest AMF species richness, even higher than the grasslands. In conclusion, AMF communities from distinct agro-ecosystems differed in species composition and seasonal and successional sporulation dynamics. (C) 2009 Elsevier B.V. All rights reserved.

Publisher Elsevier**ISSN/ISBN** 0167-8809**URL** http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T3Y-4X36TJC-1&_user=10&_coverDate=12%2F2009%28%23toc%234959%232009%23998659996%231502092%23FLA%23display%23Volume%29&_cdi=4959&_son=0&_userid=10&md5=58b02382f4499633a3ae0510def140be**edoc-URL** <http://edoc.unibas.ch/dok/A5252885>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1016/j.agee.2009.07.008

ISI-Number WOS:000271079300014

Document type (ISI) Article